

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group II, Claims 28-37, in the reply filed on 3/11/2011 is acknowledged.
2. Claims 1-27 and 38-82 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 3/11/2011.

Information Disclosure Statement

3. The information disclosure statement filed 5/11/2006 has been considered and made of record.

Claim Objections

4. The copy of the claims filed 3/11/2011 is objected to because the listing of the non-elected claims is non-compliant according to 37 CFR 1.121 because they have the incorrect status identifiers. Note the identifiers should be "withdrawn" rather than "original".

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 28 and 30-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Naughton et al.(US 6,395,538) in view of Clapper et al.(US 5,512,474) and Turner et al.(US 5,624,537).

With respect to claim 1, the reference of Naughton et al. discloses a method for culturing cells (column 15, line 61, to column 16, line 30) that includes incubating cells in a chamber (510) containing culture media (column 18, lines 15-22); detecting a target substance in the culture media with a detector disposed in the chamber (column 18, lines 23-43); and modifying culture

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conditions based on the presence or absence of the target substance detected in the culture media (column 18, lines 45-53).

While the reference of Naughton et al. discloses the use of any number of cells in the bioreactor, including animal cells (column 16, lines 2-30), the reference is silent with respect to the use of a cellular attachment surface within the culture chamber.

The reference of Clapper et al. discloses that it is conventional in the art of cell culture to provide a bioreactor with a surface for cell attachment when culturing anchorage-dependent mammalian cells (column 1, line 63, to column 2, line 12).

In view of this teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the bioreactor of the primary reference of Naughton et al. with a surface for cellular attachment when culturing anchorage-dependent mammalian cells for the known and expected result of providing an art recognized means for supporting the cells in an agitated bioreactor device (column 3, lines 44-57).

While the reference of Naughton et al. discloses the use of a probe (501) to detect a target substance such as glucose in the media and modify culture conditions based on the detection (column 18, lines 29-51), the reference differs because the detector is not surface modified with a binding agent for the target substance.

The reference of Turner et al. discloses that it is conventional in the art of bioreactors to provide a detector (biosensor device) for detecting a target analyte (glucose) in the culture medium wherein the detector is disposed in the culture chamber and includes a surface modified with a binding agent (glucose oxidase) (column 4, lines 7-10, and column 4, line 61, to column 5, line 3).

In view of this teaching, it would have been obvious to one of ordinary skill in the art to provide the biosensor device taught by the reference of Turner et al. in the bioreactor of the primary reference for the known and expected result of providing an alternative and/or additional means recognized in the art for in situ detection of glucose within the bioreactor device.

With respect to claim 30, the biosensor device disclosed by the reference of Turner et al. can be an optical detection device (column 10, lines 13-16).

With respect to claims 31, 32 and 37, the reference of Naughton et al. discloses that any number of cells can be cultured within the bioreactor device (column 16, lines 3-30).

With respect to claims 33-36, the system of the modified bioreactor system discussed above would automatically modify the culture conditions, including pH control and temperature control, based on the amount of glucose detected (column 18, lines 29-31, and column 18, lines 44-53).

9. Claims 28-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Naughton et al.(US 6,395,538) in view of Clapper et al.(US 5,512,474) and Turner et al.(US 5,624,537) taken further in view of Malitesta et al.(Anal. Chem.).

The combination of the references of Naughton et al.; Clapper et al. and Turn et al. has been discussed above.

While the glucose sensor of the modified primary reference discussed above includes a surface modified with a binding agent, claim 29 differs by reciting that the detector is a piezoelectric substrate surface-modified with a binding agent and a pair of electrodes coupling the piezoelectric substrate to an operating system.

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The reference of Malitesta et al. discloses that QCM glucose sensors are known in the art and include a substrate (quartz crystal, piezoelectric material) with electrodes and binding agent (iPPD) for detecting glucose (page 1367, "Experimental Section").

In view of this teaching, it would have been obvious to one of ordinary skill in the art to employ the QCM glucose sensor in the system of the modified primary reference for the known and expected result of providing an art recognized glucose sensor that is capable of operating in adverse operative conditions (page 1366, first column).

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to WILLIAM H. BEISNER whose telephone number is (571)272-1269. The examiner can normally be reached on Tues. to Fri. and alt. Mon. from 6:15am to 3:45pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael A. Marcheschi, can be reached on 571-272-1374. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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**/William H. Beisner/
Primary Examiner
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WHB